

KNS Precision Inc.
Adjustable Gas Piston
for
AK-47 Family Firearms
Installation & Operation
User Manual

Patent No. 10,330,408

Safety Notes

- Always obey the four laws of gun handling:
 - Treat every gun as if it were loaded
 - Do not point the muzzle at anything you are not willing to destroy
 - Always be sure of your target and what is beyond it
 - Keep your finger off the trigger until ready to fire
- Ensure the firearm is unloaded before installation
- Always wear eye protection while performing maintenance on the firearm
- Always use eye and ear protection during live fire
- Always perform gas system adjustment in accordance with the user manual procedure
- Do not make large gas system adjustments without prior incremental testing to verify safe operation

Safety Disclaimer

The KNS adjustable gas piston grants a much wider range of operating force to the gas system than was originally intended. As such, it is possible for inappropriate adjustment settings to drive the firing & extraction cycles beyond safe limits of operation.

The consequences of unsafe operation can range from damage to the operating parts, to case failures capable of fatal injury.

Always perform gas system adjustments incrementally through testing in accordance with the user manual procedure to minimize the risk of unsafe operation.

Warranty Information

This product is covered by our Lifetime Warranty against manufacturer's defects and breakage during normal use of this product. For warranty issues please send an email with your contact information and product details to info@knsprecisioninc.com.

About KNS Precision Inc.

KNS Precision, Inc. had its beginning in the summer of 1999, when two friends, one a master machinist, the other a firearms enthusiast, combined to produce and market new products for the AR15/M16 platform. With overwhelming success from the start, KNS Precision, Inc. has earned the firearm and shooting industry's acceptance through product innovation and customer service.

In 2006 the machinist sold his portion of the company to his nephew, who was also a master machinist and owned a local Swiss machine shop. KNS Precision, Inc. then moved four miles from its original location to the new machine shop. In 2008, the second partner retired and a portion of the company was sold to a military Veteran and local Police Sergeant who had been the company's Law Enforcement and Military representative since 2002.

The current owners have continued the strong traditions of the company while expanding company growth, customer service and product development.

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Other KNS Products for the AK Family



Non-Rotate Pins



Replacement Front
Sight Posts



Combo Sight
Adjustment Tool



M14x1-5/8x24
Thread Adapter

Introduction

Congratulations on purchasing the KNS Adjustable Gas Piston!

This first of its kind enhancement to the AK family of firearms brings an array of benefits to a historically limited platform.

Upon installation, users will enjoy:

- The ability to safely use a much wider variety of ammunition
- The ability to reduce the rate of fire and cyclic recoil
- The ability to quickly adjust for use with or without a silencer
- Reduced noise due to collision of operating parts and 'port pop'
- Reduced venting of gas from the chamber area into the user's face
- Repeatable, precise adjustment positions for recording settings
- A US-made component that counts toward 922r compliance
- A fully-reversible installation with no externally visible modifications
- Corrosion-resistant, easily cleaned parts for minimal maintenance

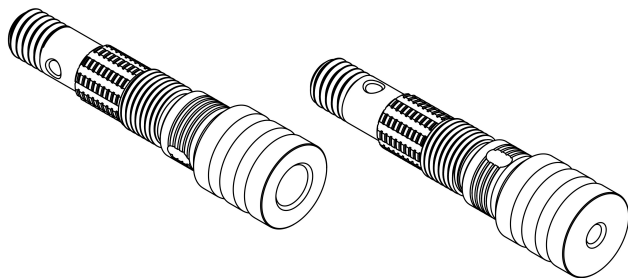
The purpose of this manual is to walk the new user through installing the KNS Adjustable Gas Piston in their weapon of choice, safely tuning it for desired operation, and keeping it maintained. Appendices with useful information for the correct selection of KNS gas piston products, suggested gas system adjustments, and troubleshooting lie at the end of this manual.

Compatibility

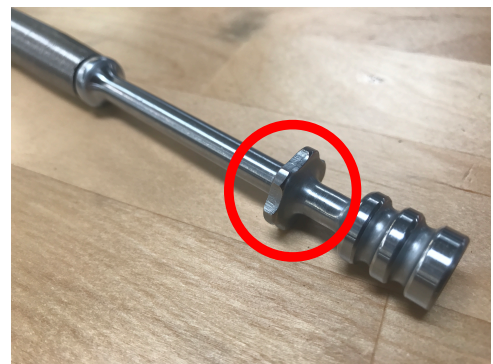
The KNS Adjustable Gas Piston is adaptable to a wide variety of AK-derived platforms. We offer a range of piston op-rod lengths that attach to the piston head assembly. Refer to the diagram below for how to measure your existing piston to ensure your KNS piston is the correct length for your gun. We have endeavored to make a suitable piston for every AK-variant; if you require a piston length that does not appear in the index of options at the end of this manual, please contact us with the necessary dimensions and we may add it to the lineup.

The KNS Adjustable Gas Piston is also offered in several different piston head designs. Small bore and other guns with gas ports near the muzzle run best with a piston that has a narrower vent hole for finer low-end adjustment. The small bore piston heads are available as complete piston assemblies for small-caliber guns that have been found to require this feature in testing; be sure to note the chambering of your AK when ordering. The large bore piston head offers a wider range of adjustment useful to the majority of (large caliber) AK variants that are highly over-gassed.

A few AK models feature a 'star guide' on the piston to align the piston head inside the gas tube. If your gun has this feature, be sure to request it when selecting & ordering your piston, as some models were made both with and without this part, and it may not be included by default. When it is not provided, a small blanking 'dummy collar' will be installed on the op-rod where it attaches to the piston head, but which can be replaced if needed.



Large-bore and small-bore piston heads



'Star Guide' piston head

Installation Procedure

ENSURE FIREARM IS UNLOADED BEFORE PROCEEDING

-Tools Required:

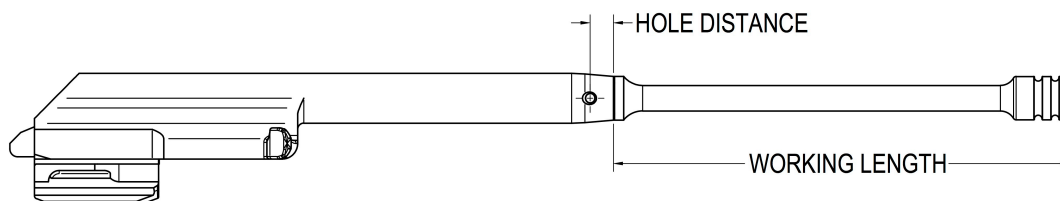
- Eye Protection
- Nail Setter Punch
- 3/32" Punch
- 16oz Hammer
- 1/8" Drill Bit & Drill Press (Optional)

-Step One: Ensure firearm is unloaded before proceeding, remove bolt carrier from firearm. Remove bolt head assembly from carrier.

-Step Two: Locate the retaining rivet or spring-pin through the nose of the bolt carrier. This is typically located $\sim 1/4"$ from the end of the carrier nose and horizontal. The rivets are ground flush with the carrier nose before finishing, so the outline of the rivet may be hard to spot at first.

Some builders punch-crimp the carrier onto the piston threads to secure it. For these, the carrier crimps must be drilled out to free the original piston head, and the KNS piston assembly drilled to match so it has the same piston length as the original. Other makers may weld the carrier & piston; we recommend buying a replacement riveted carrier instead of modifying the original, as the weld has destroyed the carrier threads too badly.

-Step Three: Ensure the piston stem is correct for your firearm by measuring the distance from the carrier nose to the end of the piston head. Next, measure from the retaining rivet to the end of the carrier nose. These distances must be within $\pm .03"$ of the KNS piston assembly to function.



**MEASURE FROM THE END OF THE BOLT CARRIER NOSE TO THE END OF THE FACTORY PISTON,
MEASURE FROM THE END OF THE BOLT CARRIER NOSE TO THE CENTER OF THE RETAINING RIVET.
THIS WILL DETERMINE WHICH MODEL OF GAS PISTON ASSEMBLY WILL FIT YOUR FIREARM.**

Installation Procedure, Continued

ENSURE FIREARM IS UNLOADED BEFORE PROCEEDING

-Step Four: Once the retaining rivet has been marked, secure the bolt carrier in a soft-jawed vice to prevent marring the finish, and use the nail setter punch and hammer at the center of the rivet or spring-pin to begin driving it out of the carrier. Be sure to keep the punch and hammer strike perpendicular to the face of the rivet. The rivet will begin to budge after a number of solid blows. If the rivet does not budge but has been properly located, it may be necessary to use a drill press to remove the rivet; for most users this is best left to a qualified gunsmith so the carrier is not damaged.

-Step Five: Once the rivet has begun to shift under the nail setter punch, the 3/32" punch should be used to drive it the rest of the way through. Much less force should be necessary to drive the rivet at this point.

-Step Six: With the rivet removed, the factory piston can be unscrewed from the carrier. Corrosion or burrs may make this somewhat difficult on some guns, but is usually easy due to loose-fitting threads.

-Step Seven: With the piston removed, screw the KNS piston assembly fully into the carrier nose. Next, unscrew the piston only as far as necessary for one of the pre-drilled holes in the piston stem to align with the holes in the carrier. In situations where a slight adjustment to the Working Length needs to be made - the op-rod may be indexed one-quarter to one-half of a turn further in or further out. Because the spring-pin is smaller in diameter than the rivet hole in most cases, there is room to bias the entire op-rod/piston assembly in either direction by this amount.

-Step Eight: With the holes aligned, carefully drive the supplied spring-pin through the two parts using the 3/32" punch and hammer. Make sure the pin does not protrude from either side of the carrier. The roll pin will likely have a loose fit in the carrier hole, but this is intentional; the threads carry all the piston force, and the pin simply prevents the piston from turning.

At this point the KNS Adjustable Gas System installation is complete, and the firearm may be reassembled and adjusted for desired operation.

Adjustment Procedure

OBSERVE ALL RULES FOR THE SAFE OPERATION OF LOADED FIREARMS

The most important point to remember when adjusting the gas system of your firearm, is to begin from a safe starting point, and work incrementally toward the desired adjustment. The KNS Adjustable Gas Piston functions by venting the existing gas volume around the piston head to reduce operating force, so the 'full closed' position most closely resembles the factory gas setting, and is a safe default setting for unsuppressed firearms shooting standard ammunition. For suppressed firearms or when shooting non-standard ammunition, excessive back pressure can result in dangerously violent operation capable of damaging the firearm or injuring the shooter.

Therefore, it is recommended that initial adjustment for any gun be done in unsuppressed semi-automatic condition, with standard ammunition.

-Step One: Begin with the firearm in the unsuppressed condition, shooting standard ammunition, and the adjustment collar turned to the full-closed position at the forward end of its travel. The goal is to start as close to the 'known good' operating state the gun was in before the piston was replaced.

If you happen to have the same configuration of firearm that was tested during development of the adjustable gas piston, you can choose to start from the suggested adjustment positions listed in Appendix B. We encourage users to submit their preferred adjustment settings & firearm configuration to KNS by email so we can populate this reference table further for public reference.

-Step Two: Verify the firearm can cycle appropriately in the fully closed position. It is best to start with a full magazine to make sure the carrier momentum can overcome the friction of rounds pressed against its underside, with the selector in the semi-automatic position so the disconnecter is struck.

-Step Three: Remove the bolt carrier group and turn the adjustment collar five (5) clicks toward the open position. Reassemble the firearm and test the function once more.

Adjustment Procedure, Continued

OBSERVE ALL RULES FOR THE SAFE OPERATION OF LOADED FIREARMS

-Step Four: Repeat Step Three in five (5) click increments until the firearm fails to complete the operating cycle. For most guns, this is 15-30 clicks from the fully closed position, but will vary.

-Step Five: Turn the adjustment collar back toward the closed position in two (2) click increments to reach a setting with reliable function. **Record this position for your own reference, since this position is the starting point from which all subsequent adjustments should take place.** The gas piston head has been marked with shallow rings where the adjustment collar sits. Each ring is separated by a full turn of the collar, or ten (10) clicks.

-Step Six: The firearm is now in a 'borderline' operating condition, where function is reliable, but operating energy is minimized. If you prefer more energetic extraction, the adjustment collar may be closed further and this preferred setting recorded.

When adding a suppressor, open the adjustment collar 10-15 clicks from the 'borderline' position recorded earlier before test firing.

When using ammunition with significantly different powder or bullet weight than standard ammunition, or changing to a different chambering or barrel length, open the the adjustment collar 10-15 clicks from the 'borderline' position before test fire. If ammunition, chambering, or barrel length is substantially different from the original, we suggest consulting a qualified gunsmith before adjusting.

Cleaning Procedure

ENSURE FIREARM IS UNLOADED BEFORE PROCEEDING

The KNS Adjustable Gas Piston requires no routine maintenance beyond that of a factory gas piston. The piston head and regulator are made of steel with corrosion resistant coatings, so they can be wiped clean with your favorite carbon solvent as-installed. Incidental fouling between the collar and head can generally be removed by working the collar back & forth a couple times.

After very large volumes of fire or with exceptionally-dirty ammunition, the gas piston ports or adjustment collar may become partially fouled. If severe enough to prevent closing the collar or if adjustment becomes difficult, the piston head assembly can be disassembled for detail cleaning:

Tools Required:

- 3/32" Punch
- 16oz Hammer

-Step One: Remove bolt carrier group from firearm, remove bolt assembly from bolt carrier.

-Step Two: Secure the bolt carrier in a soft-jawed vise and use a 3/32" punch and hammer to drive out the roll pin securing the piston head.

-Step Three: The piston head may then be unscrewed along with the adjustment collar and cleaned accordingly before reassembly.

For the newer Mod 2 design collars; be sure not to lose the small detent roller as the collar threads off the piston head. Do not attempt to remove the detent spring ring from its groove; doing so will permanently damage the spring & require it to be replaced outside of warranty.

Troubleshooting

While we have made every attempt to ensure your experience installing and using the adjustable gas piston is successful through extensive testing and research, the wide variety of AK-family firearms and their configurations is such that you may still run into problems. Please refer to these troubleshooting points for any issues you encounter, and contact us if they cannot be resolved.

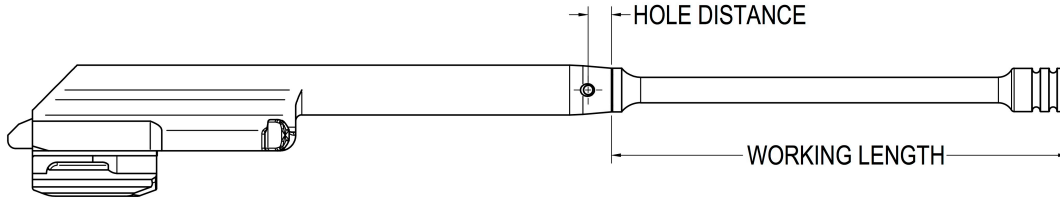
Installation:

- If the carrier retaining rivet cannot be located, you may have a welded carrier. If you have a carrier with the piston welded to the carrier, we recommend purchasing a replacement carrier before proceeding.
- If the rivet will not budge despite being securely mounted in a vise and given repeated solid blows with the nail setting punch and hammer, you may need to drill out your retaining rivet. We recommend seeking a qualified gunsmith to perform this operation.
- If the piston will not readily unscrew from the carrier, the rivet may have slightly deformed your threads. Clamp the piston rod firmly in a vise and use a wrench on the carrier to start it turning.
- The roll pin securing the KNS piston does not need to pass fully through the carrier nose or rigidly lock the stem. It simply needs to sit at or below flush on both sides while preventing the stem from turning.
- It is easiest to reassemble the Mod 2 collar by threading the head into the stationary collar, letting gravity hold the small roller in place.

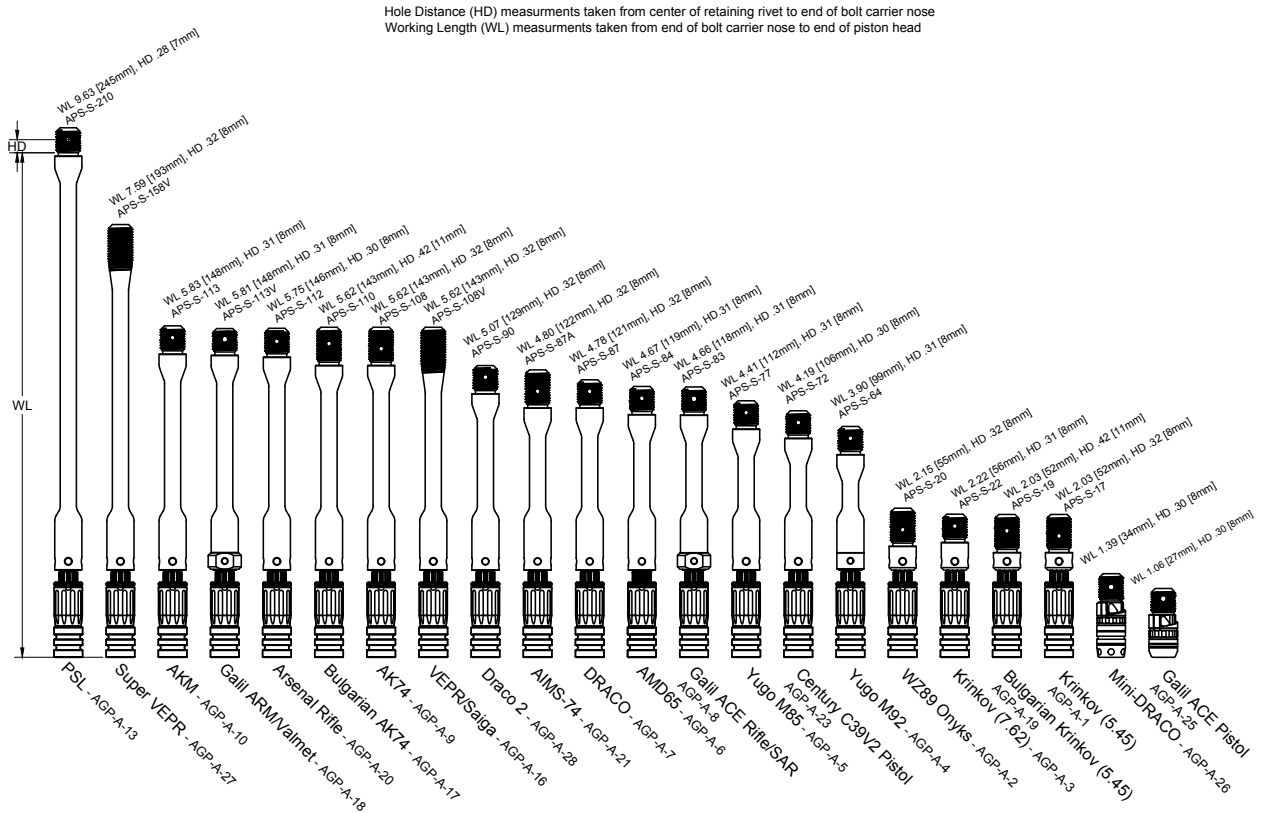
Adjustment:

- If your gun will not cycle unsuppressed in the full-closed position, first ensure the distance from the carrier retaining pin to the piston head closely matches the factory piston. If they match and the gun still will not cycle, contact us as you may need an alternate piston head with extra low-end adjustment. If the lengths differ by more than .03", contact us since a different length piston op-rod is needed.
- If your collar is sticky from fouling after extending firing schedules, work it back & forth on the piston head several times, instead of trying to turn it one direction only. This will both scrape away the troublesome carbon deposits and allow that debris to fall out of the way, freeing up the parts.

Appendix A: Currently Available Piston Sizes



**MEASURE FROM THE END OF THE BOLT CARRIER NOSE TO THE END OF THE FACTORY PISTON,
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THIS WILL DETERMINE WHICH MODEL OF GAS PISTON ASSEMBLY WILL FIT YOUR FIREARM.**



We are adding new piston options all the time. If you have an AK variant that does not appear in the chart above or our website, please let us know at knsprecisioninc.com and we may add it to the product lineup.

Due to variation in AKs, your piston's length may not perfectly match the piston assemblies in the chart above. Be sure to carefully measure the parts before making your selection, as seen in these photos;



Appendix B:

Suggested Adjustment Starting Positions

Ensure the firearm cycles in the suppressed condition using standard ammunition, with the piston regulator fully closed, before proceeding to adjust for alternate configurations

If your gun will not cycle unsuppressed in the full-closed position, first ensure the distance from the carrier retaining pin to the piston head closely matches the factory piston. If they match and the gun still will not cycle, contact us as you may need a different piston head with extra low-end adjustment. If the lengths differ by more than .03"/1mm, contact us as a different length piston stem will be needed.

All Gas Settings Taken from the Fully Closed Position (0 Clicks = Fully Closed)

Model Name	Chambering	Barrel Length	Unsuppressed	Suppressed
AK47	7.62 x 39	16.25"	20 Clicks	45 Clicks
AK74	5.45 x 39	16.3"	8 Clicks	10 Clicks
PSL	7.62 x 54r	24.4"	15 Clicks	30 Clicks
Krinkov	5.56 x 45	8.1"	2-10 Clicks	10-20 Clicks

Tuning Notes:

- Some firearms can be mis-adjusted into a dangerous operating condition by setting the gas to a powerful (closed) position in conjunction with aggravating factors like silencers/brakes, brass cases, or heavy bullets
- If adding a silencer or large-chamber muzzle device, expect to open the regulator further
- If shortening a barrel (from a previously working configuration), expect to close the regulator further, and possibly require the small bore piston head
- Silencers with larger bores or low-back-pressure baffle designs will not require the regulator to be opened as much as more common designs
- More powerful ammunition or ammo using heavier bullets will require the regulator to be opened further
- The KNS Adjustable Gas Piston can only ***reduce*** the operating force. Ammunition too weak to cycle with the stock piston will still fail to cycle.

Appendix C:

Additional Model-Specific Installation Instructions

Yugoslavian/Zastava M92:

Some of the M92 models use a round-profile gas tube that requires a 'star guide' feature behind the piston head to ensure it is guided back into the gas block. Please specify whether your factory piston has this feature so we can include a part that replicates the guide function, AGP-C-YU. The standard profile piston we ship lacks the 'star guide' and may misalign if used in a round gas tube, and the standard profile 'fluted' gas tube cannot accommodate a 'star guide'

Galil ACE Rifle/Galil SAR:

The newer Galil ACE SAR & ARM weapons use the same length op-rod as the older classic Galil rifles, but use a different diameter 'star guide' near the piston head. Take care that the piston assembly selected contains the correct 'star guide' for your application. The 'star guides' are marked with their part numbers for differentiation. The newer ACE series uses AGP-C-GA. The older Galil series, Valmet rifles, and Vektor Galil clones use AGP-C-GS.

Russian/Molot VEPR & Saiga:

The VEPR and Saiga use a punch-crimp to secure the piston against unscrewing from the bolt carrier. These crimps will need to be drilled out at .125"-.160" diameter so the original piston can be removed. The original factory-installed length of the piston that protrudes from the nose of the carrier also needs to be recorded so the replacement piston assembly can be installed to the same length. Once threaded in to match the original protruding length, the KNS piston Op-Rod will need to be drilled at .100" diameter with a #39 bit to match the holes in the carrier where the punch-crimps were originally, before the spring-pin can be installed. The VEPR/Saiga model op-rod has a softer protective coating than nitriding so it may still be successfully drilled with common steel drill bits.